



TAFE, MF 9500 4 WD



सत्यमेव जयते

भारत सरकार

कृषि एवं किसान कल्याण मंत्रालय
(कृषि, सहकारिता एवं किसान कल्याण विभाग)

GOVERNMENT OF INDIA

MINISTRY OF AGRICULTURE AND FARMERS WELFARE

(DEPARTMENT OF AGRICULTURE, CO-OPERATION AND FARMERS WELFARE)

केन्द्रीय कृषि मशीनरी प्रशिक्षण एवं परीक्षण संस्थान

ट्रैक्टर नगर, बुदनी (म.प्र.) ४६६ ४४५

CENTRAL FARM MACHINERY TRAINING & TESTING INSTITUTE

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T-1005/1529/2016

TAFE, MF 9500 4WD - Commercial (Initial)

Manufacturer	: Tractors and Farm Equipment Limited, Post Box No. 3302 35 Mahatma Gandhi Road, Nungambakkam, Chennai-600 034.
Location of other manufacturing plants (apa)	: Tractors and Farm Equipment Limited, Madurai Plant, 10/205, Kalladipatti, Dindigul-624 201, Tamilnadu (TN) : Tractors and Farm Equipment Limited, Doddaballapur Plant, Plot No. 1, KIADB Industrial Area, Doddaballapur-561 203. Karnataka (KA)
Test requested by (applicant)	: Tractors and Farm Equipment Limited, Post Box No. 3302 35 Mahatma Gandhi Road, Nungambakkam, Chennai-600 034.
Selected for test by	: Applicant
Place of running-in	: At applicant's works
Duration of said running-in (h):	
- Engine	: 12
- Transmission	: 24
Method of Selection	: The tractor was submitted directly by the applicant for test. Hence method of selection is not known.

1. SPECIFICATIONS

1.1 Tractor:	
Make	: TAFE
Model	: MF 9500 4 WD
Variants, if any	: None
Brand name	: None
Type	: Four wheeled, Four wheel drive, General Purpose, Agricultural Tractor
Year of manufacture	: GE (i.e. it means July, 2014)
Chassis number	: MEA9D6C3GE3000030
Country of Origin	: INDIA
1.2 Engine:	
Make	: SIMPSONS & Co. Ltd.
Model	: TIII A TSJ 327-F19
Type	: Four stroke, water cooled, direct injection, turbo charged, diesel engine.
Serial number	: TSJ 327 39656
Engine speed (Manufacturer's recommended production setting) (rpm) :	
- Maximum speed at no load	: 2300 to 2420
- Low idle speed	: 700 to 800
- Speed at maximum torque	: 1000 to 1200



16. SUMMARY OF OBSERVATIONS, COMMENTS & RECOMMENDATIONS

16.1 Evaluative (mandatory) / Non-evaluation (Non-mandatory) parameters applicable for qualifying Minimum Performance criteria as per Clause-4 (Table-1) of IS: 12207-2014 for acceptance of the tractor for the purpose of subsidies/NABARD financing are summarized as under:

S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2014	Values declared by the applicant (D)/ Requirement (R)	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5	6	7
16.1.1	PTO Performance :					
a)	Maximum power under 2 h test, (kW) (Natural ambient condition)	Evaluative	Declared value to be achieved with a tolerance of: -5 / +10% for PTO power >26 kW. -7.5/+10% for PTO power ≤ 26 kW or -5 / +10% for Engine power >26 kW. -7.5/+10% for Engine power ≤ 26 kW	39.0 (D)	41.5	Yes
b)	Power at rated engine speed, (kW)	Non Evaluative	-do-	39.0 (D)	41.3	Yes
c)	Specific fuel consumption corresponding to maximum power, (g/kWh)	Non Evaluative	± 5%	265 (D)	237	Yes
d)	Maximum equivalent crankshaft torque, (Nm)	Non Evaluative	± 8%	230 (D)	238.6	Yes
e)	Back-up torque, percent	Non Evaluative	10 percent, min.	7 %, Minimum	29.4	Yes
f)	Maximum operating temperature (°C):					
	1) Engine oil	Non Evaluative	The declared value should not exceed the max. value specified by the oil company and the observed value under high ambient condition should not exceed the declaration.	132 (D)	129	Yes
	2) Coolant	Evaluative	The declared value should not exceed the boiling temperature of coolant under the pressurized or otherwise and the observed value under high ambient condition should not exceed the declaration.	110 (D)	105	Yes
g)	Engine oil consumption, (g/kWh)	Evaluative	Not exceeding 1% of SFC at maximum power under High ambient conditions.	2.65	2.37	Yes
h)	Smoke level	Evaluative	Maximum light absorption coefficient of 3.25 per metre or equivalent BOSCH No. 5.2 or 75 Hatridge value (As per CMVR)	5.2 BOSCH No	1.07 per metre	Yes



1	2	3	4	5	6	
16.1.2	Drawbar performance :					
a)	Maximum drawbar pull with ballast corresponding to 15 percent wheel slip, (kN)	Non Evaluative	Minimum 65% of static mass with ballast	26.75 (D) 24.13 (R)	31.7	Yes
b)	Maximum drawbar pull with standard ballast corresponding to 15 percent wheel slip, (kN)	Evaluative	Minimum 65% of static mass of tractor without ballast or with standard ballast as the case may be.	19.4 (D) 17.4 (R)	24.3	Yes
c)	Maximum drawbar power without ballast, (kW).	Evaluative	Minimum 80 % of PTO power as referred in SI No. i) a) of PTO performance in case of tractors having total static mass > 1500 kg. Minimum 75 % of PTO power as referred in SI No. i) a) of PTO performance in case of light weight tractors having 1500 kg total static mass of tractor. Minimum 75 % of the engine power as referred in SI No. i) a) of engine performance in case of tractors which do not have a PTO shaft.	33.15 (D) 33.2 (R)	34.2	Yes
d)	Maximum transmission oil temperature (°C)	Non Evaluative	The declared value should not exceed the maximum value specified by oil company	132 (D)	102	Yes
16.1.3	Power lift and hydraulic pump performance :					
a)	Maximum lifting capacity throughout the range of lift, (kN):					
1)	At hitch points	Non Evaluative	To be declared by manufacturer [Tolerance of minus 10%]	13.50(D)	18.73	Yes
2)	With the standard frame	Evaluative	The lift capacity should at least be 24 kg/PTO kW. and it should be 21.5 kg/engine kW where the tractor is not provided with a PTO shaft and it should be 16 kg/engine hp where the tractor is not provided with a PTO shaft	12.00 (D) 9.77 (R)	18.07	Yes
b)	Maximum drop in the height of the point of application of the force after each 5 minutes interval for a total duration of 30 minute, (mm)	Non Evaluative	[Tolerance of plus 5 mm]	Observed value should not exceed 50 mm.	10	Yes
16.1.4	Brake performance at 25 kmph:					
a)	Maximum stopping distance at a force, equal to or less than 600 N on brake pedal with road ballast, (m):					
1)	Cold brake	Evaluative	10	10 (R)	6.10	Yes
2)	Hot brake	Evaluative	10	10 (R)	7.45	Yes
b)	Maximum force exerted on the brake pedal to achieve a deceleration of 2.5 m/s ² (N).	Evaluative	600	600 (R)	283 to 347	Yes
c)	Whether parking brake is effective at a force of 600 N at foot pedal(s) or 400 N at hand lever.	Evaluative	Yes / No	Yes	Yes	Yes



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1	2	3	4	5	6	7
16.1.5	Noise measurement :					
a)	Maximum ambient noise emitted by the tractor dB(A)	Evaluative	As per CMVR	88 (R)	83	Yes
b)	Maximum noise at operator's ear level dB(A)	Evaluative	As per CMVR	96 (R)	93	Yes

16.1.6	Amplitude of mechanical vibrations at :							
	1)	Left foot rest	Non Evaluative	100 microns (max)	100 (R)	40	Yes	
	2)	Right foot rest			100 (R)	160	No	
	3)	Seat (with driver seated)			-do-	100 (R)	80	Yes
	4)	Steering wheel			-do-	100 (R)	140	No
1	Air cleaner oil pull over (%).		Non Evaluative	0.25% (maximum)	Nil	Dry type air cleaner is provided	----	

16.1.7	Haulage requirements :						
a)	Gross mass of the trailers, (tones):						
	1)	Two wheel	Non Evaluative	--	5.0 (D)	5.0	Yes
	2)	Four wheel		--	6.0 (D)	6.0	Yes

b)	Distance travelled / litre of fuel consumption, (km/l):						
	1)	Two wheel	Non Evaluative	--	5.35 to 5.75 (D)	4.33 to 4.70	No
	2)	Four wheel		--	5.20 to 5.60 (D)	4.47 to 4.62	No

c)	Fuel consumption (ml/km/tonne):						
	1)	Two wheel	Non Evaluative	--	36 to 45 (D)	42.55 to 46.17	No
	2)	Four wheel		--	35 to 40 (D)	36.06 to 37.23	Yes

16.1.8	Wetland cultivation :					
	Sealing for the following assemblies:	Evaluative	The identified assemblies should essentially meet the requirement of IS: 11082. No water ingress in the identified assembly given in column-2. If tractor does not meet the requirements of wetland cultivation, it may be recommended for dry land operation only.	There should be no ingress of water and/or mud (R)	Not recommended by the applicant	----
1)	Clutch assembly	-do-				
2)	Brake housings	-do-				
3)	Front axle hubs	-do-				



1	2	3	4	5	6
16.1.9	Safety features :				
a)	Guards against moving and hot parts	Evaluative	Belt drives, pulley, silencer, hydraulic pipes (As per IS 12239 (part 2))	Conforms	Yes
b)	Lighting arrangement	Evaluative	As per CMVR	Conforms	Yes
c)	Seating requirements	Non Evaluative	Should meet the requirements of IS 12343 (as amended from time to time)	Does not Conforms	No
d)	Technical requirements for PTO shaft	Non Evaluative	Should meet the requirements of IS 4931 (as amended from time to time)	Does not Conforms	No
e)	Dimensions of three point linkage	Non Evaluative	Should meet the requirements of IS 4468 (part 1) (as amended from time to time)	Conforms	Yes
f)	Specifications of linkage drawbar	Non Evaluative	Should meet the requirements of IS 12953 and IS 12362 (part 3) (as amended from time to time)	Conforms	Yes
	Specifications of swinging drawbar	Non Evaluative		Not provided	No

16.1.10	Labelling of tractors (Provision of labelling plate):					
1)	Make	Evaluative	Should conform to the requirements of CMVR	--	TAFE	Yes
2)	Model	Evaluative		--	MF 9500 4WD	Yes
3)	Year of manufacture	Evaluative		--	GE	Yes
4)	Engine serial number	Evaluative		--	TSJ 32739656	Yes
5)	Chassis serial number	Evaluative		--	MEA9D6C3GE3000 030	Yes
6)	Declaration of PTO power, (kW)	Evaluative		--	39.0	Yes

16.1.11	Discard limit for:						
(a)	Cylinder bore diameter, (mm)	Evaluative	To be specified by the manufacturer and supported by printed literature	95.202	95.00 to 95.01	Yes	
(b)	Clearance between piston & cylinder liner at skirt, (mm)	Non Evaluative		0.25 with new ring	0.07 to 0.10	Yes	
(c)	Ring end gap (mm):						
	- Top comp. ring.	Evaluative	To be specified by the manufacturer and supported by printed literature	1.50	0.3 to 0.4	Yes	
	- 2 nd comp. ring.			-do-	1.50	1.00	Yes
	- Oil ring.			-do-	1.50	0.30 to 0.50	Yes
(d)	Ring groove clearance (mm):						
	- Top comp. ring.	Evaluative	-do-	-TAPERED-		Yes	
	- 2 nd comp. ring.			-do-	0.2	0.067 to 0.075	Yes
	- Oil ring.			-do-	0.25	0.053 to 0.067	Yes



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1	2	3	4	5	6	7
(e)	Clearance of main bearings (mm):					
	- Diametrical clearance	Evaluative	-do-	0.75	0.084 to 0.101	Yes
	- Crankshaft end float	Evaluative	-do-	0.75	0.25	Yes
(f)	Clearance of big end bearings, (mm):					
	- Diametrical	Evaluative	-do-	0.75	0.070 to 0.088	Yes
	- Axial	Evaluative	-do-	0.75	0.30	Yes
(g)	Clearance between king pin and bush, (mm)	Non Evaluative	-do-	0.35	NA	--
(h)	Clearance between center pin and bush, (mm)	Non Evaluative	-do-	1.25	0.113 to 0.148	Yes

16.1.12 CATEGORY OF BREAKDOWNS / DEFECTS :					
S. No.	Characteristic	Category (Evaluative / Non Evaluative)	Requirements as per IS: 12207-2008	As observed	Whether meets the requirements (Yes/No.)
1.	Critical	Evaluative	No critical breakdown	None	Yes
2.	Major	Evaluative	Not more than two and neither of them should be repetitive in nature.	None	Yes
3.	Minor	Evaluative	Not more than five and frequency of each should not be more than two.	One	Yes
4.	Total breakdowns	Evaluative	In no case, the total number of breakdowns should exceed five, that is, (2 major + 3 minor) or 5 minor breakdowns.	One	Yes

16.2 Optional requirements as per Clause-4 (Table-2) of IS:122107-2014:				
S. No.	Characteristic	Requirements as per IS: 12207-2014	As observed	Whether meets the requirements (Yes/No.)
1	2	3	4	5
1.	Fitment of ROPS	With a provision for fitment of ROPS. If ROPS fitted it should meet the requirement of IS: 11821-1992.	Provided ROPS not fitted	Yes Not applicable
2.	Accessories	Trailer hitch, front tow hook, linkage drawbar may be provided.	Meets the requirements	Yes



16.3 Conformity with following IS:

- i) Guide lines for declaration of power and specific fuel consumption and labeling of agricultural tractors (First revision) [IS 10273:1987 (Reaffirmed in March, 2009)] : Conforms
- ii) Agricultural tractors – Rear mounted power take-off - Types 1, 2 and 3(third revision)[IS: 4931-1995 (Reaffirmed in March, 2009)] : **Does not conform**
- iii) Agricultural wheeled tractors - Rear mounted three-point linkage: Part 1 Categories 1, 2, 3 & 4 (fourth revision) [IS 4468(Part-I):1997/ISO 730-1:1994 (Reaffirmed in March, 2009)] : Conform
- iv) Drawbar for agricultural tractors – Link type [IS 12953:1990 (Reaffirmed in March, 2007)] : Conforms
- v) Agricultural tractors - Operator's seat technical requirement [IS 12343 -1998 (First revision) (Reaffirmed in March, 2009)] : **Does not conform**
- vi) Guide for safety & comfort of operator of agricultural tractors: Part 1 General requirements (first revision) : [IS 12239 (PT-1) 1996/ISO 4254-1:1989 (Reaffirmed in (Reaffirmed in March, 2007))] : **Does not conform**
- vii) Tractors and machinery for agriculture and forestry, powered lawn and garden equipment – Symbols for operator controls and other displays [IS: 6283 (Part-1 & Part-2) -2006 & 2007 (Reaffirmed in March, 2009)]/ ISO 3767-2:1991] : Conforms
- viii) Tractors and machinery for agriculture and forestry – Technical means for ensuring safety Part 2: Tractors (first revision) (IS 12239 (PT-2) 1999) (Reaffirmed in March, 2009)] : **Does not conform**
- ix) Guide lines for location and operation of operator controls on agricultural tractors and machinery (first revision) (IS: 8133 – 1983) (Reaffirmed in March, 2009)] : Conforms
- x) Agricultural Tractor & Machinery Lighting device for travel on public roads (IS: 14683-1999) (Reaffirmed in March, 2009)] : Conforms

16.4 Salient Observations:

16.4.1 Laboratory tests:

16.4.1.1 PTO Performance:

- i) The backup torque is. **29.3%**.

16.4.1.4 Mechanical Vibration:

The amplitude of mechanical vibration on various assemblies marked as (*) in Chapter-8 of this test report is on higher side, especially at the steering control wheel, foot rest and operator seat. This calls for dampening down of vibrations to improve the operational comfort and service life of components.

16.4.1.5 Three point linkage And Linkage drawbar:

Some of the parameters of three point linkages and linkage drawbar meet to the Cat.I and some are to Cat. II. This should be looked into for necessary corrective action.

**16.4.1.7 Operator's Seat:**

Width of seat, Vertical distance from seat index point to centre of Clutch pedal, brake pedal and accelerator pedal does not meet the requirements of IS: 12343:1998 (Re-affirmed in March, 2009) and calls for necessary corrective action.
Breakdown of hydraulic

16.4.1.7 Hydraulic system:

During load maintenance of lift load the three point lift drop too fast and down within 20 mm to ground level. The o-ring of pressure relief valve and hydraulic cylinder (part no. 3761476M01) was found damaged and then replaced with new one and load maintenance test carried out further.

16.5 Maintenance / Service Problems:

No noticeable maintenance or service problem was observed during the test.

16.6 Recommendation with regard to safety on tractor:

The following requirements, inter alia, may be considered for incorporation on the tractor:

- i) Provision of spark arrester in the exhaust system.
- iii) Provision of PTO master shield.

16.7 Adequacy of Literature supplied with machine:

16.7.1 The following literature was been supplied with the tractor for reference during the testing.

- i) Operator's manual
- ii) Spare part's catalogue
- iii) Service manual

16.7.2 The supplied literature was found adequate, however, full illustration of labelling plate and list of accessories supplied with the tractor should also be included in the Owner's service manual Book-I. The service/workshop manual should also be brought for the guidance of service personnel.

16.7.3 These literatures may also be brought out in national & other regional languages for the guidance of user's and service personnel.

TESTING AUTHORITY:

RAKESH PALIWAL
AGRICULTURAL ENGINEER

P. C. MESHARAM
SENIOR AGRICULTURAL ENGINEER

C. R. LOHI
DIRECTOR**17. APPLICANT'S COMMENTS**

Para No.	Our Reference	Applicant's comments
16.1	16.3, 6.4.1.4, 16.4.1.5, 16.4.1.7, 16.4.1.7	We will look into for corrective action
16.2	16.6	We will look into for implementation of these safety features.